

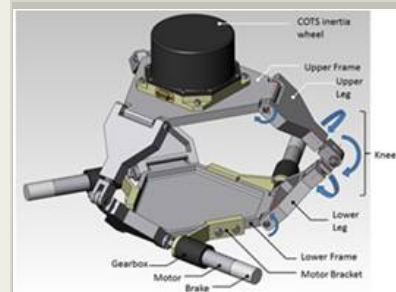
Canfield Joint - Vibration Isolation System for High Precision Pointing, Phase II

Completed Technology Project (2013 - 2016)



Project Introduction

During our Phase I STTR effort, Balcones Technologies, LLC (BT) and The University of Texas at Austin Center for Electromechanics (CEM) successfully achieved all Phase I objectives and developed concept designs for controlled Canfield Joint Systems (CJS) for numerous applications that currently employ two-axis gimbal systems, including flywheel energy storage systems, integrated flywheel energy storage and attitude control systems, controlled moment gyros (CMG), and pointing systems for satellite-to-earth and satellite-to-satellite space optical communications (SOC). While all applications offered advantages for CJS compared to gimbal alternatives, a major result from our Phase I commercialization study was that the highest payoff Phase II demonstration for NASA and other commercial applications would focus on a CJS simultaneously sized for two applications: small satellite CMG and small satellite optical communications. Since the SOC application is more demanding and this emerging application offers more terrestrial and space applications, this application will serve as our demonstration target for Phase II. Additionally, since the SOC application has demanding vibration isolation requirements (especially for deep space communications) and since the BT-CEM team has very advanced expertise in this area, our Phase II demonstration will include development and integration of a vibration isolation system (VIS). Some key CJS-SOC features include: More than 30% improvement in pointing accuracy and precision compared to 2 axis gimbal systems; Integrated vibration isolation system to meet deep space optical communication systems; Also sized for small CMG application; Wide field of regard; Scalable to large flywheel applications; Maximum use of COTS components; Exploits team core capabilities in vibration isolation systems and high precision, high accuracy point systems.



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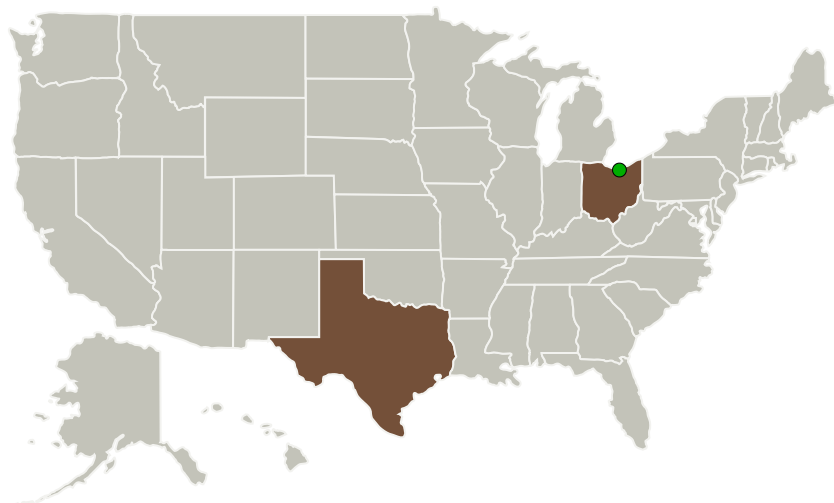
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Balcones Technologies, LLC	Lead Organization	Industry	Austin, Texas
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio
University of Texas - Center for Electromechanics	Supporting Organization	Academia	Austin, Texas

Primary U.S. Work Locations

Ohio	Texas
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Project Transitions

July 2013: Project Start

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Balcones Technologies, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

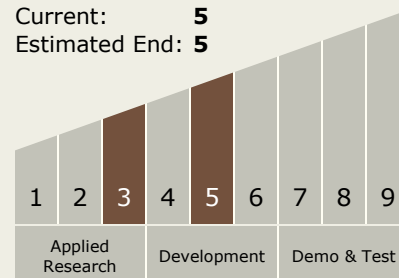
Carlos Torrez

Principal Investigator:

Joseph H Beno

Technology Maturity (TRL)

Start: **3**
 Current: **5**
 Estimated End: **5**



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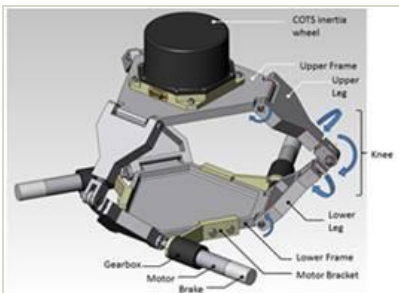
✓ **June 2016:** Closed out

Closeout Summary: Canfield Joint - Vibration Isolation System for High Precision Pointing, Phase II Project Image

Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/137353>)

Images



Briefing Chart Image

Canfield Joint - Vibration Isolation System for High Precision Pointing, Phase II
(<https://techport.nasa.gov/image/137107>)

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.2 Energy Storage
 - └ TX03.2.3 Advanced Concepts for Energy Storage

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System